

# SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Sim J. Lee Examiner #: 76060 Date: 11-5-'02  
 Art Unit: 1752 Phone Number 305-0504 Serial Number: 09/922,723  
 Mail Box and Bldg/Room Location: 9B05 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*  
 Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

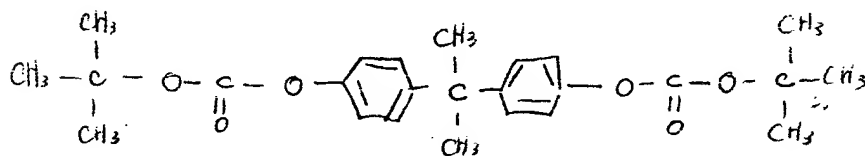
Title of Invention: Positive Resist Composition and Base Material Carrying Layer of  
the Positive Resist Composition

Inventors (please provide full names): Ogata Toshiyuki;  
Endo, Koutaro; Kornano, Hirashi.

Earliest Priority Filing Date: 08-07-'01

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

- Please search for a resist (or photoresist)  
 composition comprising a compound  
 of the following ~~structure~~ structure



( If too many, you can cross with  
 "a photoacid generator" or "PAG" )

## STAFF USE ONLY

Searcher: Jeff Harrison  
 Searcher Phone #: 306-5429  
 Searcher Location: CPY-9C18  
 Date Searcher Picked Up: 11-7-02  
 Date Completed: 11-7-02  
 Searcher Prep & Review Time: 40  
 Clerical Prep Time: \_\_\_\_\_  
 Online Time: 20

## Type of Search

NA Sequence (#) \_\_\_\_\_  
 AA Sequence (#) \_\_\_\_\_  
 Structure (#) 1  
 Bibliographic \_\_\_\_\_  
 Litigation \_\_\_\_\_  
 Fulltext \_\_\_\_\_  
 Patent Family \_\_\_\_\_  
 Other \_\_\_\_\_

## Vendors and cost where applicable

STN X  
 Dialog \_\_\_\_\_  
 Questel/Orbit \_\_\_\_\_  
 Dr.Link \_\_\_\_\_  
 Lexis/Nexis \_\_\_\_\_  
 Sequence Systems \_\_\_\_\_  
 WWW/Internet \_\_\_\_\_  
 Other (specify) \_\_\_\_\_

# SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Sin J. Lee Examiner #: 76060 Date: 11-5-'02  
Art Unit: 1752 Phone Number 305-0504 Serial Number: 09/222,723  
Mail Box and Bldg/Room Location: 2605 Results Format Preferred (circle) PAPER DISK E-MAIL

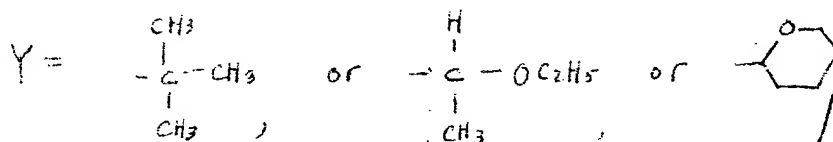
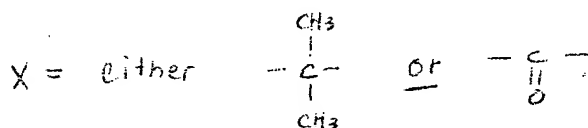
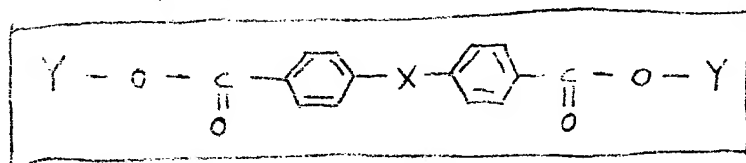
If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*  
Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Positive Resist Composition and Base Material Carrying Layer of the Positive Resist  
Inventors (please provide full names): Ogata, Toshiyuki;  
Endo, Koutaro ; Komano, Hiroshi  
Earliest Priority Filing Date: 08-07-'01

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

Please search for a resist (or photoresist) composition comprising a compound ~~as shown in the formula~~ having the following formula



(If too many, You can cross with a photoacid generator ("PAG").

## STAFF USE ONLY

Searcher: Jeff Harrison  
Searcher Phone #: 306-5429  
Searcher Location: CP4-9C18  
Date Searcher Picked Up: 11-7-02  
Date Completed: 11-7-02  
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Clerical Prep Time: 10  
Online Time: 10

## Type of Search

NA Sequence (#) \_\_\_\_\_  
AA Sequence (#) \_\_\_\_\_  
Structure (#) 1  
Bibliographic \_\_\_\_\_  
Litigation \_\_\_\_\_  
Fulltext \_\_\_\_\_  
Patent Family \_\_\_\_\_  
Other \_\_\_\_\_

## Vendors and cost where applicable

STN X  
Dialog \_\_\_\_\_  
Questel/Orbit \_\_\_\_\_  
Dr.Link \_\_\_\_\_  
Lexis/Nexis \_\_\_\_\_  
Sequence Systems \_\_\_\_\_  
WWW/Internet \_\_\_\_\_  
Other (specify) \_\_\_\_\_

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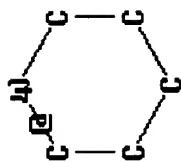
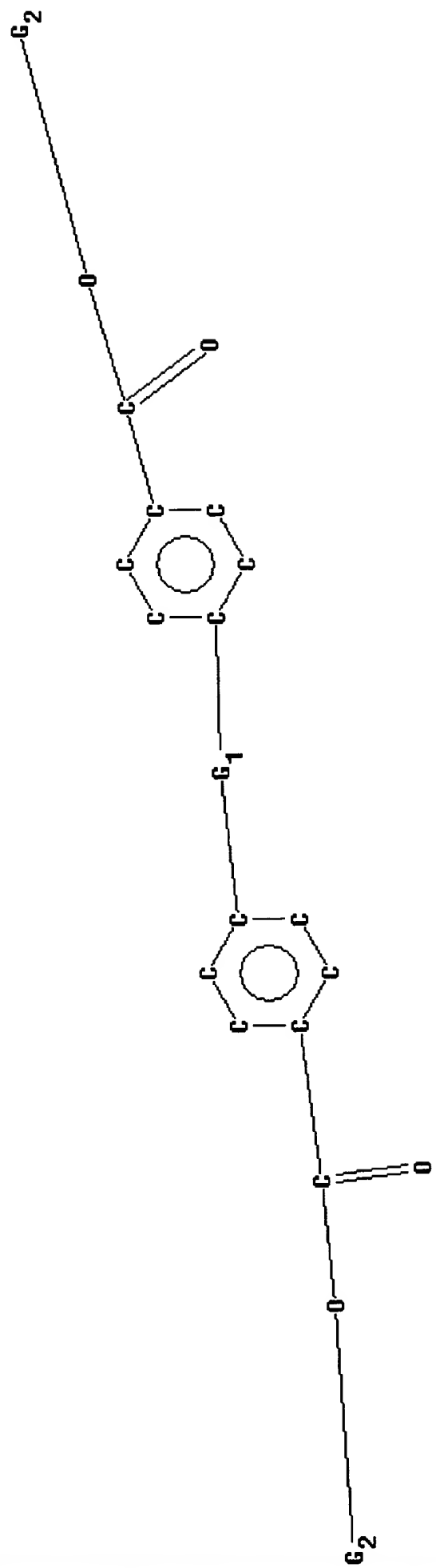
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L1      STRUCTURE UPLOADED
L2      0 S L1 SAM

FILE 'REGISTRY, MARPAT, MARPATPREV, CAPLUS' ENTERED AT 15:51:00 ON 07 NOV
2002
L3      0 S L1 SSS SAM FILE=REGISTRY
L4      13 S L3 SSS SAM FILE=MARPAT

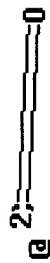
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L6      614 S L5 SSS FUL FILE=MARPAT
L7      0 S L6 SSS FUL FILE=MARPATPREV
L8      23 S L5 FILE=CAPLUS
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L10     4353 S PAG OR PHOTOACID#### GENERAT#### OR (PHOTO ACID GENERAT####
L11     3 S L8 AND (PAG OR PHOTOACID#### GENERAT#### OR (PHOTO ACID GENE
L12     1 S L6 AND (PAG OR PHOTOACID#### GENERAT#### OR (PHOTO ACID GENE
L13     0 S L7 AND (PAG OR PHOTOACID#### GENERAT#### OR (PHOTO ACID GENE
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L15     0 S L13 AND L7 FILE=MARPATPREV
L16     4 DUP REM L15 L14 L11 (0 DUPLICATES REMOVED)
L17     3 S L8 AND (PAG OR PHOTOACID#### GENERAT#### OR (PHOTO ACID GENE
L18     1 S L6 AND (PAG OR PHOTOACID#### GENERAT#### OR (PHOTO ACID GENE
L19     0 S L7 AND (PAG OR PHOTOACID#### GENERAT#### OR (PHOTO ACID GENE
L20     1 S L18 AND L6 FILE=MARPAT
L21     0 S L19 AND L7 FILE=MARPATPREV
L22     4 DUP REM L21 L20 L17 (0 DUPLICATES REMOVED)
L23     11 S L8 AND (RESIST OR PHOTORESIST) FILE=CAPLUS
L24     6 S L6 AND (RESIST OR PHOTORESIST) FILE=CAPLUS
L25     0 S L7 AND (RESIST OR PHOTORESIST) FILE=CAPLUS
L26     6 S L24 AND L6 FILE=MARPAT
L27     0 S L25 AND L7 FILE=MARPATPREV
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L31     6 S L6 AND (PAG OR PHOTOACID#### GENERAT#### OR (PHOTO ACID GENE
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L34     0 S L32 AND L7 FILE=MARPATPREV
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i-Pr<sup>1</sup>



t-Bu<sup>3</sup>



L35 ANSWER 8 OF 17 CAPLUS COPYRIGHT 2002 ACS

AN 2002:503937 CAPLUS

DN 137:85931

TI Photopolymerizable compositions containing bicyclo compounds having methine bonds and recording materials using the compositions

IN Sugiyama, Takekatsu; Matsumoto, Hirotaka; Takashima, Masanobu

PA Fuji Photo Film Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 52 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002189295	A2	20020705	JP 2000-388280	20001221

OS MARPAT 137:85931

AB The compns. comprise polymerizable compds. and I-Q = pigment-forming group; L1, L2 = (un)substituted methine, the substituents may form unsatd. aliph. ring or heterocycle; m = 0, 1; X = group for forming (un)satd. heterocycle contg. 2 S atoms condensed with a (un)substituted heterocycle represented by Yn; Y = O, S, N; n = 1-4]. The compns. may also contain compds. generating radicals or cations by reaction with I. Recording materials with layers contg. a coloring component A, a coloring component B having groups which color on their reaction with A, and the above stated photopolymerizable compns. are also claimed. Clear black-and-white or color images, suitable for printing plates, **resists**, holograms, etc., are obtained by a dry process.

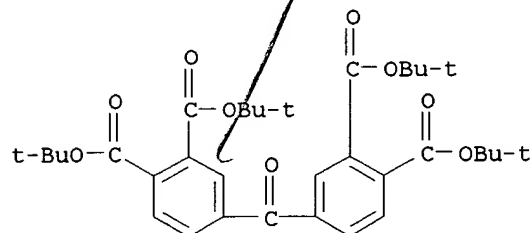
IT 128553-67-3

RL: MOA (Modifier or additive use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)

(polymn. initiator; formation of clear and high-contrast images by dry process using photopolymerizable compns. contg. methine dyes)

RN 128553-67-3 CAPLUS

CN 1,2-Benzenedicarboxylic acid, 4,4'-carbonylbis-, tetrakis(1,1-dimethylethyl) ester (9CI) (CA INDEX NAME)



L35 ANSWER 1 OF 17 MARPAT COPYRIGHT 2002 ACS

AN 136:316938 MARPAT

TI Positive resist composition and process for forming resist pattern using photosensitive laminate

IN Okubo, Waki; Sato, Kazufumi; Nitta, Kazuyuki; Ogata, Toshiyuki

PA Japan

SO U.S. Pat. Appl. Publ., 16 pp., Cont.-in-part of U.S. Ser. No. 651,099.

CODEN: USXXCO

DT Patent

LA English

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002045123	A1	20020418	US 2001-799549	20010307
	JP 2001142217	A2	20010525	JP 2000-263211	20000831
PRAI	JP 1999-245684		19990831		
	US 2000-651099		20000830		
	JP 2000-263211		20000831		

AB The present invention relates to a photosensitive laminate including a substrate and a 500-5800 angstroms thick photoresist layer formed on the substrate. A compn. for the resist layer includes (A) a compd. which generates an acid upon irradiation with radioactive ray; (B) an alkali-sol. novolak resin; and (C) a compd. having at least one acid-decomposable dissoln.-inhibiting group, and the dissoln.-inhibiting group is decomposable by action of an acid generated from the ingredient (A) to yield an org. carboxylic acid. This photosensitive laminate is sequentially subjected to selective exposure to KrF excimer laser light or to light having a short wavelength equal to or less than that of F2 laser, post-exposure baking, and developing with an alkali to yield a resist pattern.

## MSTR 1

G1—G4

G1 = Ph (SO (1-4) G2)

G2 = alkyl&lt;(-6)&gt; / cycloalkyl&lt;(-6)&gt; / loweralkoxy / OH / 12 / CO2H / 14 / 3 / 20

$$\begin{array}{c} \text{G3} \text{---} \text{CO}_2\text{H} \quad \text{O} \text{---} \text{G8} \quad \text{C}(\text{O}) \text{---} \text{O} \text{---} \text{G8} \quad \text{G3} \text{---} \text{C}(\text{O}) \text{---} \text{O} \text{---} \text{G8} \\ 3 \quad 12 \quad 14 \quad 20 \end{array}$$

G3 = alkylene&lt;(1-10)&gt;

G4 = H / Ph (SO (1-4) G2) / 5

G5—G1

G5 = C(O) / 8

$$\begin{array}{c} \text{G6} \\ \text{C} \\ \text{8} \quad \text{G7} \end{array}$$

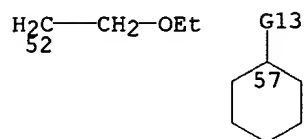
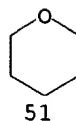
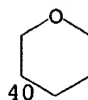
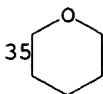
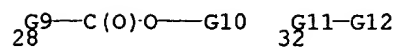
G6 = H / loweralkyl

G7 = H / loweralkyl / CO2H / 17 / 10 / 24 / Ph (SO (1-4) G2)

$$\begin{array}{c} \text{G3} \text{---} \text{CO}_2\text{H} \quad \text{C}(\text{O}) \text{---} \text{O} \text{---} \text{G8} \quad \text{G3} \text{---} \text{C}(\text{O}) \text{---} \text{O} \text{---} \text{G8} \\ 10 \quad 17 \quad 24 \end{array}$$

G8 = R<TX "dissolution-inhibiting group"> /  
(SC alkoxycarbonyl<DC (1-) M3> / 28 / Hy<EC (1-) O> /

alkyl (SR alkoxy) / 32 / Bu-t / 35 / 40 / 51 / 52 / 57 /  
CO2Bu-t)



G9 = alkylene / CH2  
G10 = alkyl<DC (1-) M3> / Bu-t  
G11 = cycloalkylene  
G12 = alkyl  
G13 = Me / Et  
MPL: claim 6

L35 ANSWER 7 OF 17 CAPLUS COPYRIGHT 2002 ACS

AN 2002:172252 CAPLUS

DN 136:224212

TI Photosensitive polysilazane composition, method of forming pattern therefrom, and method of sintering coating film thereof

IN Nagahara, Tatsuro; Matsuo, Hideki

PA Clariant International Ltd., Switz.

SO PCT Int. Appl., 67 pp.

CODEN: PIXXD2

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002019037	A1	20020307	WO 2001-JP7251	20010824
	W: CN, KR, SG, US				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
	JP 2002072502	A2	20020312	JP 2000-262703	20000831
	JP 2002072504	A2	20020312	JP 2000-268510	20000905
	JP 2002107937	A2	20020410	JP 2000-297107	20000928
	EP 1239332	A1	20020911	EP 2001-958459	20010824
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR				
PRAI	JP 2000-262703	A	20000831		
	JP 2000-268510	A	20000905		
	JP 2000-297107	A	20000928		
	WO 2001-JP7251	W	20010824		

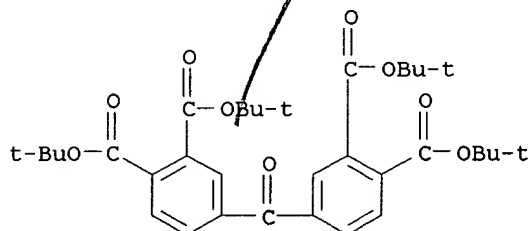
AB A pos. photosensitive polysilazane compn. comprises: a modified silsesquiazane having basic structural units represented by the general formula  $-\text{SiR}_6(\text{NR}_7)_1.5-$ , contg. other structural units represented by the general formula  $-\text{SiR}_6(\text{NR}_7)-$  and/or  $[\text{SiR}_6(\text{NR}_7)_0.5]-$  (R6-7 = H, C1-3 alkyl, or (un)substituted phenyl) in an amt. of 0.1-100 mol based on the basic structural units, and having a no.-av. mol. wt. of 100-100,000; and a photo-acid generator. It preferably contains a water-sol. compd. as a shape stabilizer. The compn. is applied to a substrate and pattern-wise exposed to light. The coating process film exposed is moistened and then developed with an aq. alkali soln. The resultant pattern is wholly exposed to light, subsequently moistened again, and then burned. Thus, a fine silica-based ceramic film which has satisfactory properties and is suitable as an interlayer dielec. is formed in a short time.

IT 128553-67-3

RL: TEM (Technical or engineered material use); USES (Uses)  
(photo-acid generator in photosensitive polysilazane compn.)

RN 128553-67-3 CAPLUS

CN 1,2-Benzenedicarboxylic acid, 4,4'-carbonylbis-, tetrakis(1,1-dimethylethyl) ester (9CI) (CA INDEX NAME)



RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT



L35 ANSWER 9 OF 17 CAPLUS COPYRIGHT 2002 ACS

AN 2002:131262 CAPLUS

DN 136:207677

TI Positive-working **photoresist** compositions and substrates equipped with **photoresist** layers

IN Ogata, Toshiyuki; Endo, Kotaro; Komano, Hiroshi

PA Tokyo Ohka Kogyo Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 14 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

*Pat Family Equivalent*

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002055452	A2	20020220	JP 2000-240871	20000809
	US 2002025495	A1	20020228	US 2001-922723	20010807
PRAI	JP 2000-240871	A	20000809		
OS	MARPAT 136:207677				

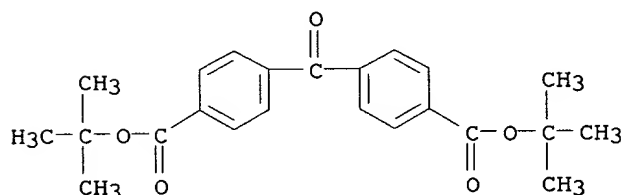
AB The compns. contain (A) alk.-sol. polysiloxanes, (B) radiation-activated **photoacid generators**, and (C) compds. with their H on phenolic OH or carboxyl groups substituted with .gtoreq.1 acid dissociative groups. Preferable compds. for component (C) is given in Markush I (Z = OH, carboxyl; R1-3 = H, OH, halogen, C1-5 alkoxyl, C1-6 linear, branched, or cyclic alkyl; A = direct bond, (carboxyl-substituted) C1-5 alkylene or C2-5 alkylidene, carbonyl, Q, Q1, Q2; R4 = H, C1-5 alkyl; R5-6 = H, halogen, OH, C1-5 alkyl or alkoxy; R7-8 = C1-5 alkyl; R9-10 = H, OH, C1-5 alkyl; m = integer of 1-6) with its H on Z substituted with tertiary alkyloxycarbonylalkyl, tertiary alkyloxycarbonyl, tertiary alkyl, cyclic ether, and/or alkoxyalkyl. Substrates with a 1st **resist** layer consisting of an org. polymer and a 2nd 50-200 nm-thick **resist** layer comprising the claimed compns. are also claimed. **Resist** patterns with high resoln. and excellent profiles are formed by irradiation with excimer lasers or extreme UV beams.

IT 145531-11-9

RL: TEM (Technical or engineered material use); USES (Uses)  
(alk.-sol. polysiloxane-based pos. **photoresist** compns. contg. **photoacid generators** and acid-dissociative compds.)

RN 145531-11-9 CAPLUS

CN Benzoic acid, 4,4'-carbonylbis-, bis(1,1-dimethylethyl) ester (9CI) (CA INDEX NAME)



L35 ANSWER 10 OF 17 CAPLUS COPYRIGHT 2002 ACS

AN 2001:847635 CAPLUS

DN 136:12819

TI Photopolymerizable compositions sensitive to UV through IR radiations and their recording materials

IN Takashima, Masanobu; Matsumoto, Hiroataka

PA Fuji Photo Film Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 58 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001324807	A2	20011122	JP 2000-142112	20000515

OS MARPAT 136:12819

AB The comps. comprise polymerizable compds. and I (L1-3 = (un)substituted methine, the substituents may form unsatd. aliph. ring or heterocycle; Z1 = group for forming 5- or 6-membered heterocycle optionally condensed with (un)substituted arom. ring or heterocycle; Y = NR1R2, OR3, SOnR4; R1-4 = H, monovalent substituted; n = 0, 1, 2; m = 0, 1, 2, 3). The comps. may also contain compds. generating radicals or cations by reaction with I. Recording materials with layers contg. a coloring component A, a coloring component B having groups which color on their reaction with A, and the above stated photopolymerizable compds. are also claimed. Clear black-and-white or color images, suitable for printing plates, resists, holograms, etc., are obtained by a dry process.

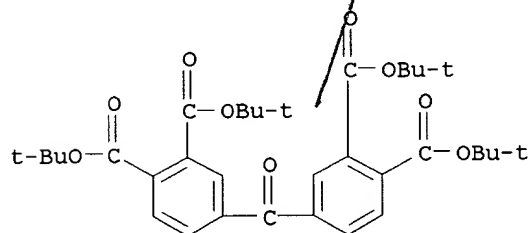
IT 128553-67-3

RL: MOA (Modifier or additive use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)

(polymn. initiator; formation of clear and high-contrast images by dry process using photopolymerizable compds. contg. methine dyes)

RN 128553-67-3 CAPLUS

CN 1,2-Benzenedicarboxylic acid, 4,4'-carbonylbis-, tetrakis(1,1-dimethylethyl) ester (9CI) (CA INDEX NAME)



L35 ANSWER 11 OF 17 CAPLUS COPYRIGHT 2002 ACS

AN 2001:753095 CAPLUS

DN 135:310926

TI Modified polysilsesquiazanes, their photosensitive compositions, and manufacture of their patterned films

IN Nagahara, Tatsuo; Matsuo, Hideki

PA Tonengeneral Sekiyu K. K., Japan

SO Jpn. Kokai Tokkyo Koho, 13 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

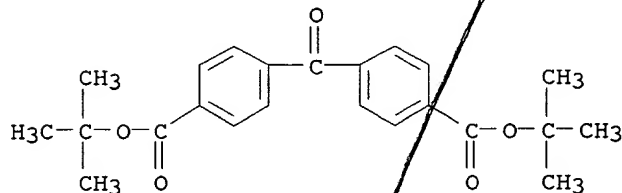
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001288270	A2	20011016	JP 2000-108023	20000405

AB The polysilsesquiazanes with no.-av. mol. wt. 100-100,000 comprise (A) SiR1(NR2)1.5 units and (B) 0.1-100 mol% SiR12NR2 and/or SiR13(NR2)0.5 units [R1 = C1-3 alkyl, (un)substituted Ph; R2 = H, C1-3 alkyl, (un)substituted Ph]. The photosensitive comps. showing good storage stability contain the polysilsesquiazanes and **photoacid generators** selected from sulfoximes and triazines. The patterned films are manufd. by applying the comps., patternwise irradiating the resulting films with light, and dissolving the irradiated parts of the films. The films are useful for substitutes for Si-contg. **resists** because of high resistance to O plasma. SiO2-based ceramic films as interlayer insulating films are obtained by firing or keeping the films for a long time.

IT **145531-11-9**  
 RL: CAT (Catalyst use); USES (Uses)  
 (**photoacid generators**; modified polysilsesquiazanes for **photoresists** with good storage stability)

RN 145531-11-9 CAPLUS

CN Benzoic acid, 4,4'-carbonylbis-, bis(1,1-dimethylethyl) ester (9CI) (CA INDEX NAME)



L35 ANSWER 2 OF 17 MARPAT COPYRIGHT 2002 ACS

AN 133:36172 MARPAT

TI High-sensitivity storage-stable photopolymerization initiators,  
 photopolymerizable compositions, photosensitive colored compositions,  
 color filters, and liquid crystal display devices

IN Sato, Hiroyuki; Fukumura, Takanori; Kato, Takashi; Oizumi, Fumitaka

PA Chisso Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

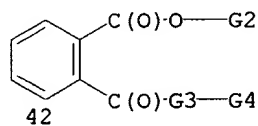
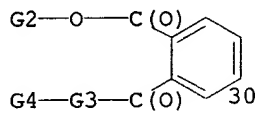
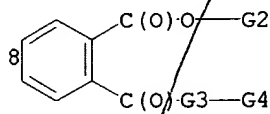
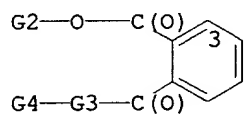
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000159827	A2	20000613	JP 1998-339915	19981130
	US 6344299	B1	20020205	US 1999-440702	19991116
	TW 469267	B	20011221	TW 1999-88120081	19991117
	KR 2000035772	A	20000626	KR 1999-53763	19991130
PRAI	JP 1998-339915		19981130		

AB The photopolymn. initiators have arom. structures I (R1, R2 = C4-15 tertiary alkyl, C9-15 tertiary aralkyl; X1, X2 = O, NH; R3 = C1-30 org. group not having O directly linked to X1; R4 = C1-30 org. group not having O directly linked to X2, C4-15 tertiary alkoxy, C9-15 tertiary aralkyloxy) or II (R5, R7-R11 = C4-15 tertiary alkyl, C9-15 tertiary aralkyl; R6, R12 = C4-15 tertiary alkoxy, C9-15 tertiary aralkyloxy, C1-3 org. group not having O directly linked to X3; X3 = O, NH; R13 = C2-8 alkylene; m = 1-30; n = 0-30). Photopolymerizable compns., photosensitive colored compns., color filters, and liq. crystal display devices prepd. with the benzophenonetetracarboxylic acid peroxide deriv. initiators are also claimed.

## MSTR 1

G1—C(O)—G1

G1 = 3 / 8 / 30 / 42



G2 = alkyl&lt;(4-15)&gt; / alkyl&lt;(1-)&gt; (SR (1-) aryl&lt;(6-)&gt;)

G3 = O / NH

G4 = R&lt;TX "organic group", EC (1-30) C&gt; / alkyl&lt;(4-15)&gt; / alkyl&lt;(1-)&gt; (SR (1-) aryl&lt;(6-)&gt;)

MPL: claim 1

NTE: alkyl group at G2 and G4 are tertiary groups

NTE: substitution is restricted

L35 ANSWER 3 OF 17 MARPAT COPYRIGHT 2002 ACS

AN 131:152595 MARPAT

TI Photopolymer compositions and semiconductor devices using thereof for negative-patterned protective and interlayer insulator films

IN Hagiwara, Hideo; Komatsu, Hiroshi; Miya, Yoshihiro

PA Hitachi Chemical Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 11 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

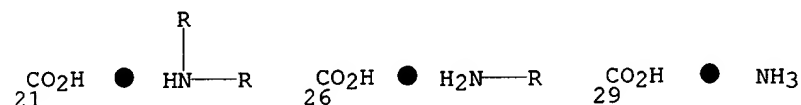
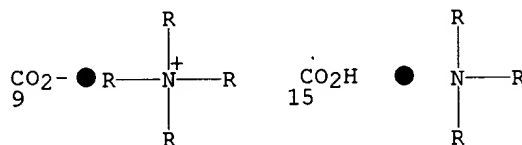
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11209610	A2	19990803	JP 1998-19413	19980130

AB The title photopolymer compns. comprise (1) an arom. monomer AR1R2R3R4 (A = tetravalent arom. group; R1-4 = -CO2R5, -CONHR6, -COO-N+R7R8R9R10, -CO2H, wherein .gtoreq.1 of R1-4 are groups other than -CO2H and R5-7 have photochem. polymg. double bonds and R8-10 are H or monovalent org. groups), (2) a polyimide precursor or a water-sol. polyimide, and (3) a photosensitizer. The compns. give the title semiconductor devices neg.-patterned protective and interlayer insulator films with excellent resoln., patterning, adhesive, mech., and thermal properties without causing reflow cracking.

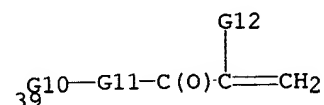
MSTR 1

G1—CO<sub>2</sub>H

G1 = aryl (SR (3) G2) / (SC Ph (SR (3) G2) / 31 / 33)

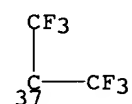
$$\begin{array}{c} \text{G5—G6} \\ 31 \end{array} \quad \begin{array}{c} \text{G8—G7—G9} \\ 33 \end{array}$$
G2 = 3 / 6 / 9 / 15 / 21 / 26 / 29 / CO<sub>2</sub>H
$$\begin{array}{c} \text{C(O)—O—G3} \\ 3 \end{array} \quad \begin{array}{c} \text{C(O)—NH—G3} \\ 6 \end{array}$$


G3 = R / (EX 39)



G5 = phenylene (SR (1) G2)

G6 = Ph (SR (2) G2)

G7 = O / SO<sub>2</sub> / 37 / C(O)

G8 = phenylene (SR (1) G2)  
G9 = Ph (SR (2) G2)  
G10 = alkylene<(1-10)>  
G11 = O / NH  
G12 = H / Me  
MPL: claim 1

L35 ANSWER 12 OF 17 CAPLUS COPYRIGHT 2002 ACS

AN 1998:613798 CAPLUS

DN 129:296163

TI Silicon composition for etching mask used for manufacturing electric components

IN Kaji, Rikako; Hayase, Shuji; Mikoshiba, Akira; Nakano, Yoshihiko; Sato, Yasuhiko

PA Toshiba Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 26 pp.

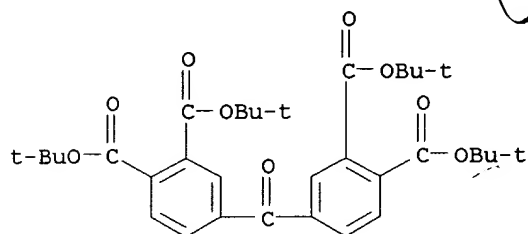
CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10251519	A2	19980922	JP 1997-63277	19970317
AB	The silicon compn. comprises a hydrogen silsesquixane, an acid generating compd. upon reacting with an acid, another acid generating compd. upon irradiation. The compn. provides a fine SiO <sub>2</sub> pattern, which has the high T <sub>g</sub> value and highly transparent at the deep UV region, by alk. development.				
IT	128553-67-3				
	RL: TEM (Technical or engineered material use); USES (Uses) (compn. for etching mask used for manufg. elec. components)				
RN	128553-67-3 CAPLUS				
CN	1,2-Benzenedicarboxylic acid, 4,4'-carbonylbis-, tetrakis(1,1-dimethylethyl) ester (9CI) (CA INDEX NAME)				



L35 ANSWER 13 OF 17 CAPLUS COPYRIGHT 2002 ACS

AN 1998:338637 CAPLUS

DN 129:47315

TI Development of the chemically amplified three-component positive electron beam resist

AU Horibe, Hideo; Kumada, Teruhiko; Fujino, Takeshi; Kimura, Yoshika; Kubota, Shigeru

CS Advanced Technol. R &amp; D Cent., Mitsubishi Electric Corp., Amagasaki, Hyogo, 661-8661, Japan

SO Kobunshi Ronbunshu (1998), 55(5), 231-242  
CODEN: KBRBA3; ISSN: 0386-2186

PB Kobunshi Gakkai

DT Journal

LA Japanese

AB The dissoln. characteristics of a chem. amplified electron beam (EB) resist composed of partially tert-butoxycarbonyl group (tBOC) protected poly(p-vinyl phenol) (PVP), a dissoln. inhibitor, and an acid generator butoxycarbonyl group (tBOC) protected poly(p-vinyl phenol) (PVP), a dissoln. inhibitor, and an acid generator were investigated. The resist sensitivity was improved with decreasing tBOC ratio of the matrix resin. As the tBOC ratio were increased, the thickness loss decreased and the resoln. of the resist was better. SEM observation of the pattern profile was carried out to investigate the sensitivity and the resoln. of the resist. The optimum tBOC ratio was 23.8%. As dissoln. inhibitors, hydroquinone protected by a tert-butoxycarbonyl group (B-HQ) and isophthalic acid protected by a tert-Bu group (B-IP) are used. Dissoln. inhibitors (B-HQ and B-IP) become dissoln. promoters (HQ and IP) after exposure. The dissoln. rate of the resist consisting of B-IP was faster than that of B-HQ in the exposed area after exposure. The dissoln. rate of the resist consisting of B-IP was faster than that of B-HQ in the exposed area. PK, of IP is smaller than that of HQ, and the acidity of IP is higher than that of HQ. Therefore IP enhances the soly. of the matrix resin in the alk. developer. We evaluated the dependence of sensitivity of the resist upon acid generators. Triphenylsulfonium triflate (S-Tf), diphenyliodonium triflate (I-Tf), triphenylsulfonium antimonate (S-Sb), and diphenyliodonium antimonate (I-Sb) were used. The higher the concn. of S-Tf, the better this sensitivity of the resist. When 3% of acid generator was added to the resist, the sensitivity of the resist was S-Tf (12.5 .mu.C/cm2) < S-Sb (10-0 .mu.C/cm2) < I-Tf (7.0 .mu.C/cm2) < I-Sb (5.0 .mu.C/cm2). When iodonium ion was used as cation, the sensitivity of the resist was better. When antimonate ion as anion was used, the sensitivity of the resist was better. A 0.14 .mu.m line and space pattern is fabricated at 17.5 .mu.C/cm2 using 50 keV EB in the resist (tBOC-PVP, B-IP, I-Tf).

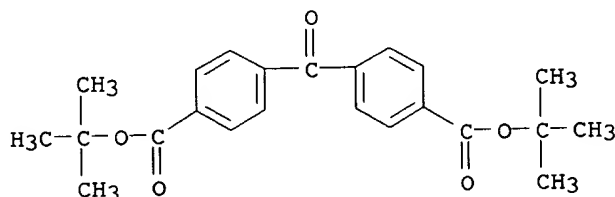
IT 145531-11-9

RL: MOA (Modifier of additive use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(dissoln. inhibitor; development of chem. amplified three-component pos. electron beam resist)

RN 145531-11-9 CAPLUS

CN Benzoic acid, 4,4'-carbonylbis-, bis(1,1-dimethylethyl) ester (9CI) (CA INDEX NAME)





L35 ANSWER 14 OF 17 CAPLUS COPYRIGHT 2002 ACS

AN 1996:735155 CAPLUS

DN 126:96775

TI Studies on the decrease of dissolution rate in unexpected areas of chemically amplified three-component **resist** by means of dissolution inhibitors. II. Decrease of dissolution rate in unexpected areas of chemically amplified three-component **resist** by means of tert-butyl carboxyl ester as a dissolution inhibitor

AU Horibe, Hideo

CS Advanced Technol. R&amp;D Center, Mitsubishi Electric Corp., Amagasaki, 661, Japan

SO Kobunshi Ronbunshu (1996), 53(11), 737-744

CODEN: KBRBA3; ISSN: 0386-2186

PB Kobunshi Gakkai

DT Journal

LA Japanese

AB The dissoln. characteristics of a chem. amplified **resist** composed of poly(p-vinylphenol) (PVP) partially protected by tert-butoxycarbonyl group (tBOC), a dissoln. inhibitor and an acid generator, were investigated. The dissoln. rate was estd. by using a model-compn. **resist** which consists of tBOC-PVP as matrix resin and tert-Bu carboxylate esters as dissoln. inhibitors. The relationship between the mol. wt. of tert-Bu carboxylate and the dissoln. rate of model-compn. **resist** was evaluated. The higher the mol. wt. of tert-Bu carboxylate ester, the lower the dissoln. rate of model-compn. **resist**. IR spectra showed that the higher the mol. wt. of tert-Bu carboxylate ester, the less the decompn. rate of the tBu group of the dissoln. inhibitors at prebake. It is thought that the polymer hardness became softer by adding a dissoln. inhibitor with a low mol. wt. It was found that a dissoln. inhibitor with a high mol. wt. decreases the dissoln. rate of a **resist** in the unexposed area. The **resist** which consists of tBOC-PVP, 2,2'-dithiosalicylic acid protected by tert-Bu group and an acid generator exhibited 0.12 .mu.m L & S patterns using 80 .mu.C/cm<sup>2</sup> EB with 50 keV acceleration voltage.

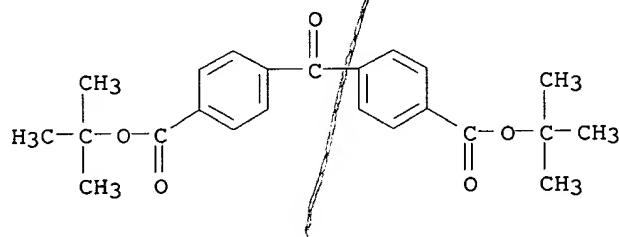
IT 145531-11-9

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(dissoln. inhibitor; decrease of dissoln. rate in unexpected areas of chem. amplified three-component **photoresist** by tert-Bu carboxylates esters dissoln. inhibitors)

RN 145531-11-9 CAPLUS

CN Benzoic acid, 4,4'-carbonylbis-, bis(1,1-dimethylethyl) ester (9CI) (CA INDEX NAME)



L35 ANSWER 16 OF 17 CAPLUS COPYRIGHT 2002 ACS

AN 1993:459533 CAPLUS

DN 119:59533

TI Synthesis and characterization of a low-stress photosensitive polyimide  
 AU Nader, Allan E.; Imai, Kazunori; Craig, John D.; Lazaridis, Christina N.;  
 Murray, Daniel O., III; Pottiger, Michael T.; Dombchik, Stephen A.;  
 Lautenberger, William J.

CS Exp. Stn. Lab., Du Pont Electron. Chem., Wilmington, DE, 19880-0336, USA

SO Polymer Engineering and Science (1992), 32(21), 1613-17

CODEN: PYESAZ; ISSN: 0032-3888

DT Journal

LA English

AB Use of polyimides with thermal coeffs. of expansion comparable to that of the underlying substrate is crit. to achieving low stress in microelectronic packaging applications. Photosensitive polyimides are finding increased use because of their significant redn. in device processing steps. A neg. working photosensitive polyimide, based on the 3,3',4,4'-biphenyldianhydride/p-phenylenediamine backbone, was prepd. that incorporates these key features. The polyimide exhibits excellent photosensitivity and lithog. behavior, while retaining many thermal and phys. properties of the polymer framework.

IT 146219-91-2P

RL: PREP (Preparation)

(synthesis and characterization of low-stress photosensitive polyimide)

RN 146219-91-2 CAPLUS

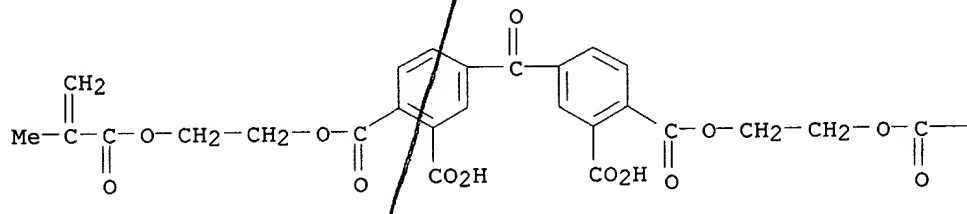
CN 1,2-Benzenedicarboxylic acid, 4,4'-carbonylbis-, 1,1'-bis[2-[(2-methyl-1-oxo-2-propenyl)oxy]ethyl] ester, polymer with 1,4-benzenediamine and 4,4'-oxybis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

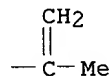
CRN 97401-11-1

CMF C29 H26 O13

PAGE 1-A



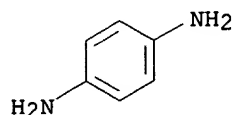
PAGE 1-B



CM 2

CRN 106-50-3

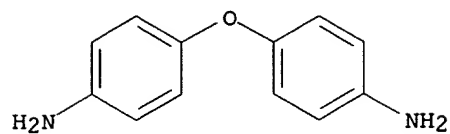
CMF C6 H8 N2



CM 3

CRN 101-80-4

CMF C12 H12 N2 O



L35 ANSWER 5 OF 17 MARPAT COPYRIGHT 2002 ACS

AN 118:136249 MARPAT

TI Resist materials for pattern formation using partially protected alkali-soluble polymer

IN Kubota, Shigeru; Kumada, Teruhiko; Tanaka, Sachiko; Horibe, Hideo; Hizuka, Yuji

PA Mitsubishi Electric Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 04158363	A2	19920601	JP 1990-285465	19901022

AB The resist materials consist of (1) an alkali-sol. polymer of which 5-50% of its functional groups providing alkali-sol. are protected by a protective group which is decompd. by acids or bases and (2) a compd. which generates an acid or base by irradiation and optionally (3) a compd. which becomes alkali-sol. on decompn. by acid or base. The materials show high sensitivity toward radiation and provide high resolu. fine patterns. A soln. contg. poly(p-vinylphenol) protected with di-tert-butylidicarbonate and Ph2I.BF4 was coated on a Si wafer to give a resist, which gave a submicron pattern by using a deep UV ray.

## MSTR 1A

G1—G2—O—G3

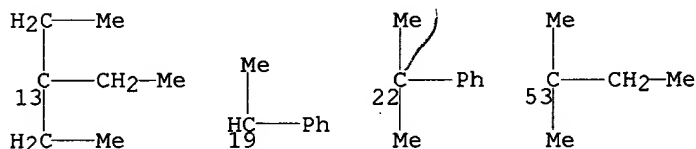
G1 = alkyl (SO (1-3) 2) / aryl (SO (1-3) 59) /  
(EX Ph (SO (1-2) 62) / 42 // 47)

G2—O—G3    G5—C(O)—O—G3    G6—G7—G8—G2—O—G3    G2—O—G3  
2                      42                      47                      59

G2—O—G3  
62

G2 = C(O) / SO2

G3 = Bu-t / 53 / 13 / Ph / 19 / 22



G5 = cyclohexylene

G6 = phenylene

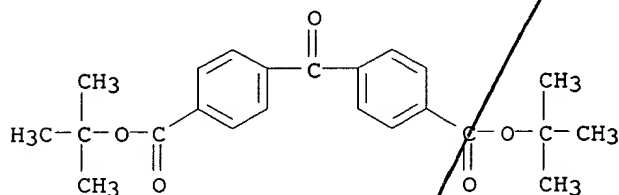
G7 = C(O) / O

G8 = phenylene

MPL: disclosure

L35 ANSWER 15 OF 17 CAPLUS COPYRIGHT 2002 ACS  
 AN 1993:136237 CAPLUS  
 DN 118:136237  
 TI Composition for positive-working photoresist  
 IN Kumada, Teruhiko; Tanaka, Sachiko; Horibe, Hideo; Kubota, Shigeru; Hizuka, Yuji  
 PA Mitsubishi Electric Corp., Japan  
 SO Jpn. Kokai Tokkyo Koho, 8 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 04037760	A2	19920207	JP 1990-145117	19900601
AB	The title compn. contains alkali-sol. polymers, a compd(s). that will release acids when exposed to radiation, and gtoreq.1 compds. selected from Ar(XCR1R3R2)m and Y(Ar(XCR1R3R2)m)2 [Ar = benzene ring or heterocycle: Y = single bond, O, SO2, CH2, CO, CMe2, C(CF3)2; X = CO2, OCO2, SO3; R1-3 = H, alkyl, alkoxy, alkenyl, alkynyl, Ph; m = 1-4]. This compn. shows high photosensitivity and resolving power (up to 1/4 .mu.m level).				
IT	145531-11-9 RL: TEM (Technical or engineered material use); USES (Uses) (photoresist compn. contg.)				
RN	145531-11-9 CAPLUS				
CN	Benzoic acid, 4,4'-carbonylbis-, bis(1,1-dimethylethyl) ester (9CI) (CA INDEX NAME)				



L35 ANSWER 6 OF 17 MARPAT COPYRIGHT 2002 ACS

AN 113:106442 MARPAT

TI Unsaturated .beta.-keto ester acetals and their use in photoimaging compositions

IN Schulthess, Adrian; Hunziker, Max

PA Ciba-Geigy A.-G., Switz.

SO Eur. Pat. Appl., 34 pp.

CODEN: EPXXDW

DT Patent

LA German

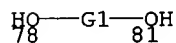
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 347381	A1	19891220	EP 1989-810430	19890607
	EP 347381	B1	19920212		
	R: BE, CH, DE, ES, FR, GB, IT, LI, NL, SE				
	US 5059698	A	19911022	US 1989-363801	19890609
	CA 1337771	A1	19951219	CA 1989-602272	19890609
	JP 02051509	A2	19900221	JP 1989-150333	19890613

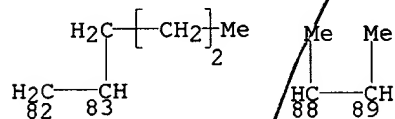
PRAI CH 1988-2257 19880613

AB The title compds. (I) or YXCOCHR8CR1OR12OR13 [n = 0-2; R1 = H, alkyl, Ph, benzyl, etc.; R2-R8 = H, halogen, alkyl, Ph, naphthyl, CO2R9, -p-C6H4CO2R9, SO2R9 (R9 = alkyl, Ph); X = O, S, NR10 (R10 = H, R9); Y = CR11:CH2, -p-C6H4-CR11:CH2, ZOCR11:CH2, II, ZOCOCR11:CH2, ZNR11COCR11:CH2, ZO2CCH:CHCO2R11, ZNR11CH2COCH:CHCO2R11 (R11 = R10; Z = .gtoreq.2 methylene group-contg. residue; R12, R13 = R9, naphthyl)] are prepd. for use in photoimaging compns. for photoresists, integrated circuit manufg., printing plates, and the like.

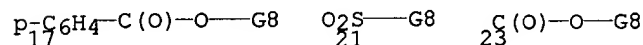
## MSTR 4



G1 = alkylene<(2-4)> (SO (1-) G2) / (EX CH2CH2 / CH2CH2CH2 / 82-78 83-81 / 88-78 89-81 )



G2 = X / alkyl<(1-10)> (SO (1-) X) / Cb<EC (6-10) C, AR (1-), BD (ALL) N, RC (1-2), RS (1-2) E6 (0) OTHER> (SO (1-) G7) / 17 / 21 / 23



G7 = X / CN / NO2 / alkyl&lt;(1-4)&gt;

G8 = alkyl&lt;(1-6)&gt; (SO (1-) G10) / Ph

G10 = X / NO2

MPL: claim 5

L35 ANSWER 17 OF 17 CAPLUS COPYRIGHT 2002 ACS  
 AN 1990:488254 CAPLUS  
 DN 113:88254  
 TI Photopolymerizable composition for printing plates  
 IN Okamoto, Yasuo; Koike, Mitsuru; Kita, Nobuyuki  
 PA Fuji Photo Film Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 24 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 01298348	A2	19891201	JP 1988-129647	19880527
	JP 2547613	B2	19961023		

AB In the title photopolymerizable compn. contg. an ethylenic monomer, photopolymn. initiators, and optionally a linear polymer, the polymn. initiator is a combination of .gtoreq.1 of each selected from (1) .gtoreq.1 org. B anion salt of cationic org. dye or combinations thereof, (2) .gtoreq.1 selected from a compd. contg. a C-halogen bond, an arom. oxinium salt or arom. halonium, and an org. peroxide, and (3) I [Ar = II or III; R1, R3 = H, alkyl; R3-7 = H, halo, alkyl, alkenyl, aryl, OH, alkoxy, SR9, SOR9, SO2R9; R9 = alkyl, alkenyl; R8 = H, alkyl, acyl; Y1 = H, IV]. The photosensitive compn. is sensitive toward an Ar laser beam.

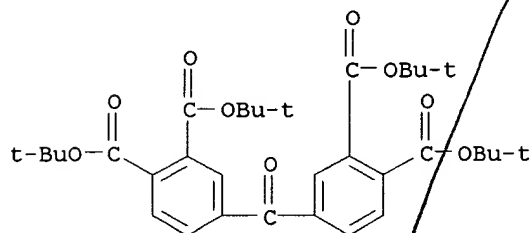
IT 128553-67-3

RL: USES (Uses)

(photopolymn. initiator, photoresistant contg.)

RN 128553-67-3 CAPLUS

CN 1,2-Benzenedicarboxylic acid, 4,4'-carbonylbis-, tetrakis(1,1-dimethylethyl) ester (9CI) (CA INDEX NAME)



FILE 'CAPLUS' ENTERED AT 15:18:46 ON 07 NOV 2002  
S 117458-06-7/REG#

FILE 'REGISTRY' ENTERED AT 15:18:47 ON 07 NOV 2002  
L6 1 S 117458-06-7/RN

FILE 'CAPLUS' ENTERED AT 15:18:47 ON 07 NOV 2002  
L7 111 S L6  
L8 4663 S PAG OR PHOTOACID#### OR PHOTO ACID####  
L9 10091 S GENERAT####(2A)ACID###  
L10 77 S L7 AND L8-9  
L11 67 S L7(L) (PAG OR PHOTOACID#### OR PHOTO OR RESIST)  
L12 59 S L7(L) (RESIST)  
L13 11 S L7(L) (PAG OR PHOTOACID#### OR (PHOTO ACID))  
L14 3 S L12 AND L13  
L15 98 S L7 AND RESIST  
L16 65 S L11 AND L15  
L17 4900 S POSITIVE(2A)RESIST  
L18 54 S L7 AND L17  
L19 26 S L7 AND (PAG OR PHOTOACID#### GENERATOR OR (PHOTO ACID GENERA  
L20 4501 S POSITIVE(2A)PHOTORESIST  
L21 28 S L7 AND L20

=> s 119 and (117 or 121)  
L22 14 L19 AND (L17 OR L21)

=> s 17(1)photoresist  
29725 PHOTORESIST  
18198 PHOTORESISTS  
33978 PHOTORESIST  
(PHOTORESIST OR PHOTORESISTS)  
L23 39 L7(L)PHOTORESIST

=> s (112 or 123) and 113  
L24 11 (L12 OR L23) AND L13

=> s 122 or 124  
L25 17 L22 OR L24



L25 ANSWER 1 OF 17 CAPLUS COPYRIGHT 2002 ACS

AN 2002:777870 CAPLUS

TI Optically active compound and photosensitive resin composition.

IN Hanabata, Makoto; Sato, Masahiro; Katayama, Junko; Kitajima, Satsuki; Niwa, Atsushi

PA Kansai Research Institute, Inc., Japan

SO PCT Int. Appl., 166 pp.

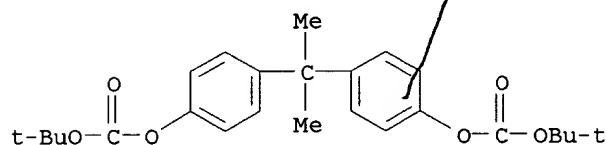
CODEN: PIXXD2

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002079131	A1	20021010	WO 2002-JP3140	20020329
	W: CA, KR, US				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
PRAI	JP 2001-97019	A	20010329		
	JP 2001-97020	A	20010329		
AB	The disclosed optically active compds. are represented by the following formula (1) and is used in combination with a photosensitizer: $A-[(J)m-(X-Pro)]n$ (1) wherein A represents a hydrophobic unit comprising at least one hydrophobic group selected among hydrocarbon groups and heterocyclic groups; J represents a connecting group; X-Pro represents a hydrophilic group protected by a protective group Pro eliminable with light irradiation; m is 0 or 1; and n is an integer of 1 or larger. The protective group Pro may be eliminable upon light irradiation by the action of the photosensitizer (esp. an acid generator), or may be a hydrophobic protective group. The hydrophilic group may be hydroxyl, carboxyl, etc. The optically active compd. is highly sensitive even to short-wavelength lights and is useful in the field of resists for forming a pattern with high resolution.				
IT	<b>117458-06-7P</b> RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (synthesis and use as photosensitive compd. for <b>photoacid generator</b> type <b>photoresist</b> compns.)				
RN	117458-06-7 CAPLUS				
CN	Carbonic acid, (1-methylethylidene)di-4,1-phenylene bis(1,1-dimethylethyl) ester (9CI) (CA INDEX NAME)				



L25 ANSWER 2 OF 17 CAPLUS COPYRIGHT 2002 ACS

AN 2002:638186 CAPLUS

DN 137:192762

TI Amine compounds, resist compositions and patterning process

IN Hatakeyama, Jun; Kobayashi, Tomohiro; Watanabe, Takeru

PA Shin-Etsu Chemical Co., Ltd., Japan

SO U.S. Pat. Appl. Publ., 40 pp.

CODEN: USXXCO

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002115018	A1	20020822	US 2001-3288	20011206
	JP 2002249478	A2	20020906	JP 2001-369719	20011204
PRAI	JP 2000-373316	A	20001207		

OS MARPAT 137:192762

AB Amine compds. having a cyano group are useful in resist compns. for preventing a resist film from thinning and also for enhancing the resolu. and focus margin of resist. The invention amine compds. have general formulas: (R2)<sub>b</sub>-N-(R1-CN)<sub>a</sub>; I; (R2)<sub>b</sub>-N-(R1C(=O)OR<sub>4</sub>-CN)<sub>a</sub>; II (R<sub>1,4</sub> = C1-4 alkylene; R<sub>2</sub> = C1-20 cycloc alkyl which may contain a hydroxy group, ether, carbonyl, ester, lactone ring, carbonate, cyano group; R<sub>3</sub> = C2-20 alkylene which may contain hydroxy, ether, thioether, carbonyl, ester, thioester group, carbonate; a = 1-3; a+b = 3).

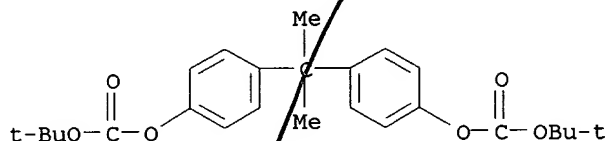
IT 117458-06-7

RL: TEM (Technical or engineered material use); USES (Uses)

(photoacid generator; amine compds. and photoresist compns. for patterning process)

RN 117458-06-7 CAPLUS

CN Carbonic acid, (1-methylethylidene)di-4,1-phenylene bis(1,1-dimethylethyl) ester (9CI) (CA INDEX NAME)



L25 ANSWER 3 OF 17 CAPLUS COPYRIGHT 2002 ACS  
 AN 2002:131262 CAPLUS  
 DN 136:207677  
 TI **Positive-working photoresist compositions and substrates equipped with photoresist layers**  
 IN Ogata, Toshiyuki; Endo, Kotaro; Komano, Hiroshi  
 PA Tokyo Ohka Kogyo Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 14 pp.  
 CODEN: JKXXAF

DT Patent  
 LA Japanese

FAN.CNT 1

PAT FAMILY EQUIVALENT

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002055452	A2	20020220	JP 2000-240871	20000809
	US 2002025495	A1	20020228	US 2001-922723	20010807
PRAI	JP 2000-240871	A	20000809		
OS	MARPAT 136:207677				

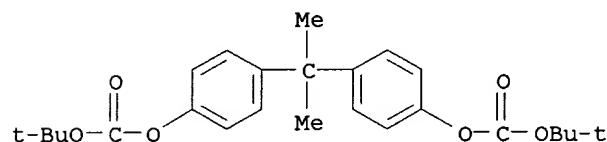
AB The compns. contain (A) alk.-sol. polysiloxanes, (B) radiation-activated **photoacid generators**, and (C) compds. with their H on phenolic OH or carboxyl groups substituted with .gtoreq.1 acid dissociative groups. Preferable compds. for component (C) is given in Markush I (Z = OH, carboxyl; R1-3 = H, OH, halogen, C1-5 alkoxy, C1-6 linear, branched, or cyclic alkyl; A = direct bond, (carboxyl-substituted) C1-5 alkylene or C2-5 alkylidene, carbonyl, O, Q1, Q2; R4 = H, C1-5 alkyl; R5-6 = H, halogen, OH, C1-5 alkyl or alkoxy; R7-8 = C1-5 alkyl; R9-10 = H, OH, C1-5 alkyl; m = integer of 1-6) with its H on Z substituted with tertiary alkyloxycarbonylalkyl, tertiary alkyloxycarbonyl, tertiary alkyl, cyclic ether, and/or alkoxyalkyl. Substrates with a 1st resist layer consisting of an org. polymer and a 2nd 50-200 nm-thick resist layer comprising the claimed compns. are also claimed. Resist patterns with high resolu. and excellent profiles are formed by irradn. with excimer lasers or extreme UV beams.

IT 117458-06-7

RL: TEM (Technical or engineered material use); USES (Uses)  
 (alk.-sol. polysiloxane-based **pos. photoresist**  
 compns. contg. **photoacid generators** and  
 acid-dissociative compds.)

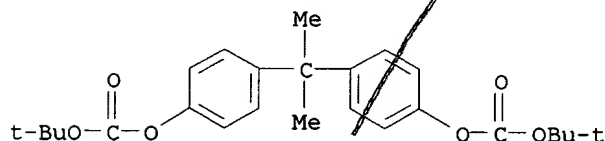
RN 117458-06-7 CAPLUS

CN Carbonic acid, (1-methylethylidene)di-4,1-phenylene bis(1,1-dimethylethyl) ester (9CI) (CA INDEX NAME)



L25 ANSWER 5 OF 17 CAPLUS COPYRIGHT 2002 ACS  
 AN 1999:246939 CAPLUS  
 DN 130:274098  
 TI Photoresist composition  
 IN Watanabe, Satoshi; Watanabe, Osamu; Furihata, Tomoyoshi; Takeda, Yoshifumi; Nagura, Shigehiro; Ishihara, Toshinobu; Yamaoka, Tsuguo  
 PA Shin-Etsu Chemical Co., Ltd., Japan  
 SO Eur. Pat. Appl., 82 pp.  
 CODEN: EPXXDW  
 DT Patent  
 LA English  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 908783	A1	19990414	EP 1998-308175	19981008
	EP 908783	B1	20020731		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 11190904	A2	19990713	JP 1998-299177	19981006
	US 6136502	A	20001024	US 1998-167567	19981007
PRAI	JP 1997-291681	A	19971008		
AB	A photoresist compn. comprises (A) an org. solvent, (B) at least <u>two</u> polymers with wt.-av. mol. wts. of 1000-500,000, which have at least one type of acid labile groups <u>and are crosslinked</u> within a mol. and/or between mols. with crosslinking groups having C-O-C linkages, and (C) a photoacid generator. The photoresist compn. has excellent sensitivity and resolu. and provides resist patterns of outstanding thermal stability, reproducibility, and plasma etching resistance. Patterns obtained with the photoresist compn. are less prone to overhanging and have excellent dimensional controllability. The photoresist compn. is suitable as a micropatterning material for VLSI fabrication.				
IT	<b>117458-06-7</b>				
	RL: TEM (Technical or engineered material use); USES (Uses) ( <b>photoresist</b> compns. contg. crosslinked polymers having acid labile groups, <b>photoacid</b> generators and)				
RN	117458-06-7 CAPLUS				
CN	Carbonic acid, (1-methylethylidene)di-4,1-phenylene bis(1,1-dimethylethyl) ester (9CI) (CA INDEX NAME)				



L25 ANSWER 7 OF 17 CAPLUS COPYRIGHT 2002 ACS

AN 1998:414837 CAPLUS

DN 129:101934

TI Radiation-sensitive resin composition

IN Suwa, Mitsuhito; Iwasawa, Haruo; Kajita, Toru; Iwanaga, Shin-ichiro

PA Japan Synthetic Rubber Co., Ltd., Japan

SO Eur. Pat. Appl., 35 pp.

CODEN: EPXXDW

DT Patent

LA English

FAN.CNT 1

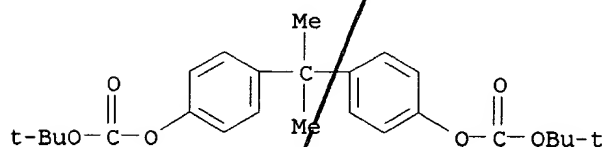
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 849634	A1	19980624	EP 1997-121963	19971212
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	US 6187504	B1	20010213	US 1997-976662	19971124
	JP 10232490	A2	19980902	JP 1997-347330	19971203
	US 2001014427	A1	20010816	US 2000-739833	20001220
	US 6322949	B2	20011127		
PRAI	JP 1996-353866	A	19961219		
	US 1997-976662	A3	19971124		

AB A pos.-tone or neg.-tone radiation-sensitive resin compn. comprises (A) a **photoacid generator** represented by the formula I or II wherein R1, R2, R5, and R6 are an alkyl group; R3 and R7 are a hydroxyl group or -OR4 (wherein R4 is an org. group); A1- and A2- indicate a monovalent anion; a and c denote an integer of 4-7; and b and d denote an integer of 0-7. The pos.-tone radiation-sensitive resin compn. further comprises (B1) an acid-cleavable group-contg. resin or (B2) an alkali-sol. resin and an alkali soly. control agent and the neg.-tone radiation-sensitive resin compn. further comprises (C) an alkali-sol. resin and (D) a crosslinking agent. The resin compn. is highly sensitive and exhibits superior resoln. and pattern forming performance.

IT 117458-06-7  
RL: TEM (Technical or engineered material use); USES (Uses)  
(**photoresist** compns. contg. arom. **photoacid generators** and)

RN 117458-06-7 CAPLUS

CN Carbonic acid, (1-methylethylidene)di-4,1-phenylene bis(1,1-dimethylethyl) ester (9CI) (CA INDEX NAME)



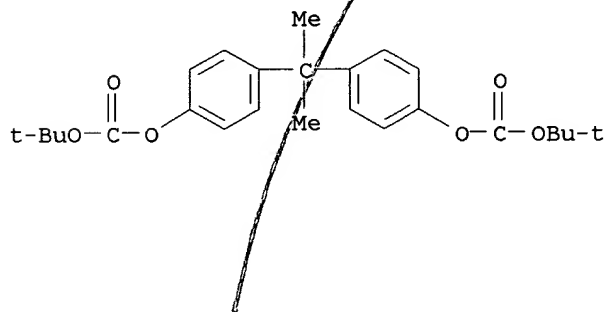
L25 ANSWER 6 OF 17 CAPLUS COPYRIGHT 2002 ACS  
 AN 1999:56807 CAPLUS  
 DN 130:146230  
 TI Chemically amplified **positive-working photoresist** with  
 good resolution in dry condition  
 IN Hatakeyama, Jun; Takemura, Katsuya; Nagura, Shigehiro  
 PA Shin-Etsu Chemical Industry Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 17 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11015163	A2	19990122	JP 1997-185812	19970626

AB The photoresist contains al alc. compd. with b.p. (at 760 mmHg)  
 $\text{gtoreq.180.degree.}$ . The other constituents for above may be an org.  
 solvent, a base resin (Mw 5000-100,000) where  $\text{gtoreq.10 mol\% H}$  of  
 phenolic OH are replaced with an acid-unstable group  $\text{CR1R2OR3}$  (I; R1, R2 =  
 H, C1-10 alkyl; R3 = C1-10 hydrocarbyl), and an acid generator. The base  
 resin may be crosslinked via  $\text{CR4R5(OR6)BOA[O(R6O)BCR4R5]a'}$  and/or  
 $\text{CR4R5OR6BA[BR6OCR4R5]a'}$  [R4; R5 = H, C1-8 alkyl; R6 = C1-10 alkylene; b =  
 0-10; A = a-valent C1-50 satd. aliph., arom., alicyclic, or heterocyclic  
 group; B = CO<sub>2</sub>, NHC<sub>2</sub>, NHCONH; a = 2-8; a' = 1-7]. A macromol. of Mw  
 3000-300,000 comprising II [R11 = H, Me; R12 = C1-8 alkyl; R13 = an  
 acid-unstable group other than I; d  $\text{gtoreq.0}$ ; e > 0; d + e = 1; 0.5  
 $\text{ltoreq. e/(d + e) ltoreq.1.0}$ ], or a dissoln. inhibitor having an  
 acid-unstable group, may be incorporated in above photoresist.

IT **117458-06-7**  
 RL: MOA (Modifier or additive use); TEM (Technical or engineered material  
 use); USES (Uses)  
 (dissoln. inhibitor; chem. amplified **pos. photoresist**  
 contg. high-b.p. alcs. and showing good patterning ability in dry  
 condition)

RN 117458-06-7 CAPLUS  
 CN Carbonic acid, (1-methylethylidene)di-4,1-phenylene bis(1,1-dimethylethyl)  
 ester (9CI) (CA INDEX NAME)



L35 ANSWER 4 OF 17 MARPAT COPYRIGHT 2002 ACS

AN 130:168032 MARPAT

TI Preparation of alicyclic carboxylic acid tert-butyl esters from the corresponding aromatic esters

IN Hiramane, Tadashi; Masuda, Toru

PA Honshu Chemical Industry Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 18 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

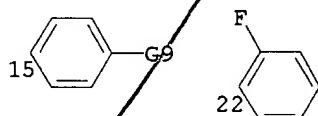
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11029528	A2	19990202	JP 1997-181306	19970707
OS	CASREACT 130:168032				
AB	<p>XmZ1[CO2CMe3]n [X = OH, CO2, C1-8 (halo)alkyl, C5-6 cycloalkyl, C1-18 alkoxy, C5-12 cycloalkoxy; Z1 = residue of bicyclohexyl, decahydronaphthalene, Z22O (Z2 = cyclohexyl), Z22CO, Z22CR1R2, cyclohexane; R1, R2 = H, halo, C1-6 (halo)alkyl; m = 0-4; n = 1-4], useful as dissoln. inhibitors for chem.-amplified photoresists (no data), are prep'd. by hydrogenation of XmZ1[CO2CMe3]n (X, m, n = same as above; Z1 = residue of biphenyl, naphthalene, Ph2O, Ph2CO, Ph2CR1R2; R1, R2 = same as above) in the presence of metal hydrides, noble metals (supported on carriers), or noble metal complexes as catalysts. Di-tert-Bu 2,6-naphthalenedicarboxylate was hydrogenated over Rh/C at 100.degree. and 20 kg/cm2 for 4.5 h to give di-tert-Bu 2,6-decahydronaphthalenedicarboxylate.</p>				

## MSTR 1

G1—C(O)OBu-t

G1 = biphenyl (SO G2) / naphthyl (SO G2) / 4 /  
Ph (SO G2) / (SC toyl / 15 / 22)

G4—G5—G6



G2 = (-3) CO2Bu-t / (-4) G3

G3 = OH / CO2H / alkyl<(1-8)> (SO (1-) X) / cyclopentyl /  
cyclohexyl / alkoxy<(1-18)> / cycloalkyloxy<(5-12)>

G4 = phenylene (SO (1-) G7)

G5 = O / C(O) / 7

G8

C

7

G8

G6 = Ph (SO (1-) G7)

G7 = CO2Bu-t / OH / CO2H / alkyl<(1-8)> (SO (1-) X) /  
cyclopentyl / cyclohexyl / alkoxy<(1-18)> /  
cycloalkyloxy<(5-12)>

G8 = H / X / alkyl&lt;(1-6)&gt; (SO (1-) X) / (SC CF3)

G9 = Bu-t / OMe

MPL: claim 1

NTE: substitution is restricted

L25 ANSWER 4 OF 17 CAPLUS COPYRIGHT 2002 ACS

AN 2000:166145 CAPLUS

DN 132:214779

TI Chemically amplified resist material

IN Itani, Toshiro

PA NEC Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.

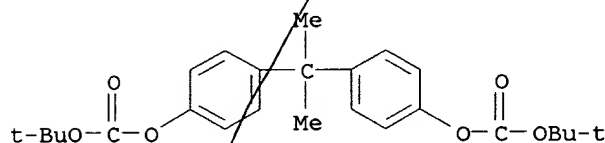
CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000075489	A2	20000314	JP 1998-241247	19980827
AB	The title resist material contains an alicyclic acrylic resin having protective groups of which the polarity is changed by acid, a photoacid generator, and either a bisphenol deriv. having protective groups of which the polarity changes or a hydrogenated polyhydroxystyrene deriv. The material provides high resolu. resist patterns with good dry etch resistance and thermal resistance.				
IT	117458-06-7				
	RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)				
	(chem. amplification resist compn. contg. acrylic resin, photoacid generator, and bisphenol deriv. or hydrogenated polyhydroxystyrene deriv.)				
RN	117458-06-7 CAPLUS				
CN	Carbonic acid, (1-methylethylidene)di-4,1-phenylene bis(1,1-dimethylethyl) ester (9CI) (CA INDEX NAME)				





L25 ANSWER 8 OF 17 CAPLUS COPYRIGHT 2002 ACS

AN 1998:277228 CAPLUS

DN 129:10629

TI Photoresist composition containing 4-phenylpyridine as additive

IN Niki, Hirokazu; Wakabayashi, Hiromitsu; Hayase, Rumiko; Oyasato, Naohiko; Onishi, Yasunobu; Sato, Kazuo; Chiba, Kenji; Hayashi, Takao

PA Kabushiki Kaisha Toshiba, Japan

SO U.S., 21 pp., Cont.-in-part of U.S. Ser. No. 781,512, abandoned.

CODEN: USXXAM

DT Patent

LA English

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5744281	A	19980428	US 1997-898747	19970501
	JP 07134419	A2	19950523	JP 1994-125006	19940607
	JP 3297199	B2	20020702		
	US 5658706	A	19970819	US 1994-302319	19940908
PRAI	JP 1993-228969	A	19930914		
	JP 1994-125006	A	19940607		
	US 1994-302319	A1	19940908		
	US 1997-781512	B2	19970109		

AB A photoresist compn. for forming a pattern, which comprises (a) a polymer represented by the formula  $I$  wherein  $R_1$  is a hydrogen atom or a Me group,  $R_2$  is a monovalent org. group,  $m$  is 0 or a pos. integer,  $n$  is a pos. integer, and  $m$  and  $n$  satisfying the inequality  $0.03 \leq n/(m+n) \leq 1$ , (b) a compd. capable of generating an acid when irradiated with light, and (c) 4-phenylpyridine, wherein the wt.-av. mol. wt. ( $M_w$ ) and the no.-av. mol. wt. ( $M_n$ ) of  $I$  satisfy the inequalities  $4000 \leq M_w \leq 50,000$  and  $1.10 \leq M_w/M_n \leq 2.50$  ( $M_w$  and  $M_n$  resp. represent value converted in styrene).

IT 117458-06-7

RL: TEM (Technical or engineered material use); USES (Uses)

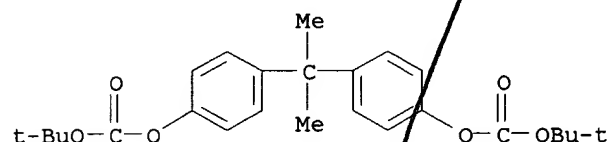
(pos. chem. amplified photoresists contg.

hydroxystyrene copolymers, photoacid generators,

nitrogen-contg. compds. and)

RN 117458-06-7 CAPLUS

CN Carbonic acid, (1-methylethylidene)di-4,1-phenylene bis(1,1-dimethylethyl) ester (9CI) (CA INDEX NAME)



L25 ANSWER 9 OF 17 CAPLUS COPYRIGHT 2002 ACS

AN 1997:479313 CAPLUS

DN 127:115290

TI Chemically amplification-type **positive-working resist**  
compositionIN Watanabe, Osamu; Natakeyama, Jun; Nakura, Shigehiro; Ishihara, Toshinobu  
PA Shin-Etsu Chemical Industry Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 30 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09160246	A2	19970620	JP 1995-337899	19951201
	JP 3052815	B2	20000619		

OS MARPAT 127:115290

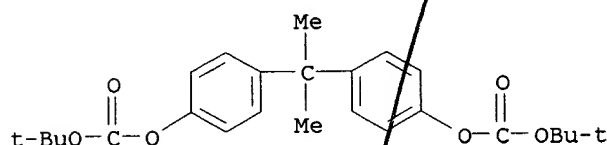
AB The title compn. comprises (A) an org. solvent, (B) a polymer with structural repeating units I [R1 = H, Me; R4, R5 = H, C1-6 alkyl; R6 = C1-10 alkyl; m = 1-3; n, p, q = d.p. satisfying following relations:  $0.02 \leq p/(p+q+r) \leq 0.5$ ,  $0.01 \leq q/(p+q+r) \leq 0.3$ ,  $0 < (p+q)/(p+q+r) \leq 0.8$ ] with a wt. av. mol. wt. of 3,000-300,000, (C) an acid generator, and (D) a soly.-controlling agent (11 Markush structures are given) with a wt. av. mol. wt. of 100-1,000 and contg. substituted phenolic groups. The compn. suitable for manufg. LSIs shows high sensitivity towards high energy rays.

IT 117458-06-7

RL: TEM (Technical or engineered material use); USES (Uses)  
(soly.-controlling agent, chem. amplification-type **pos**  
.-working **resist** compn.)

RN 117458-06-7 CAPLUS

CN Carbonic acid, (1-methylethylidene)di-4,1-phenylene bis(1,1-dimethylethyl)  
ester (9CI) (CA INDEX NAME)



L25 ANSWER 10 OF 17 CAPLUS COPYRIGHT 2002 ACS

AN 1997:320991 CAPLUS

DN 126:299691

TI Chemically-amplified **positive**-working **resist** material containing organic solvents having group unstable to acid

IN Watanabe, Satoshi; Oikawa, Katsuyuki; Takeda, Yoshifumi; Nagura, Shigehiro

PA Shinetsu Chem Ind Co, Japan

SO Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09068803	A2	19970311	JP 1995-246873	19950831
	JP 3060913	B2	20000710		

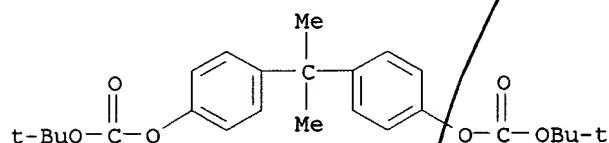
AB The resist material contains an alkali-sol. resin, a **photoacid generator**, and an org. solvent contg. an org. solvent with b.p. 90-200.degree. having .gtoreq.1 group which in unstable to acid. The solvent is preferably selected from AcOCMe<sub>3</sub>, EtCO<sub>2</sub>CMe<sub>3</sub>, and PrCO<sub>2</sub>CMe<sub>3</sub>. The material may contain a dissoln. inhibitor having a group which in unstable to acid and a fluorosurfactant. The material is sensitive to high-energy beam, esp. to KrF excimer laser, shows good resoln., storage stability, film-forming property, and provides a resist profile with rectangular shape.

IT 117458-06-7

RL: TEM (Technical or engineered material use); USES (Uses)  
 (dissoln. inhibitor; chem.-amplified **pos.**-working  
**resist** material contg. org. solvents having group unstable to  
 acid to improve resoln.)

RN 117458-06-7 CAPLUS

CN Carbonic acid, (1-methylethylidene)di-4,1-phenylene bis(1,1-dimethylethyl)  
 ester (9CI) (CA INDEX NAME)



L25 ANSWER 11 OF 17 CAPLUS COPYRIGHT 2002 ACS

AN 1996:95386 CAPLUS

DN 124:246458

TI Resist materials using glyoxime derivative as photoacid-generating agents

IN Watanabe, Atsushi; Yagihashi, Fujio; Ookaya, Sukeko

PA Shinetsu Chem Ind Co, Japan

SO Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 07295222	A2	19951110	JP 1994-110324	19940426
	JP 2906999	B2	19990621		

OS MARPAT 124:246458

AB The title material contains, as a photoacid-generating agent, a glyoxime deriv. R3O2SON:CR1CR2:NOSO2R3 (R1, R2 = alkyl, cycloalkyl, aryl, heteroaryl; R1 and R2 may form a cyclic structure; R3 = alkyl, cycloalkyl, aryl, heteroaryl). The resist may comprise (1) the glyoxime deriv., and (2) aq. alkali-insol. polymer which becomes alk. sol. by acid. The materials show high sensitivity toward radiations such as high energy UV rays, electron beams, X-ray, and the like and good thermal stability and resistance to alk. impurities. Thus, a pos.-working resist comprised bis-O-(p-toluenesulfonyl)-.alpha.-diphenylglyoxime, tetrahydropyranyl-protected poly(p-hydroxystyrene), and di-tert-butoxycarbonylbisphenol A.

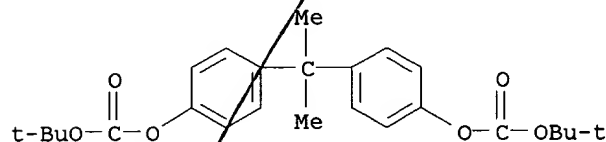
IT 117458-06-7, Di-tert-butoxycarbonyl Bisphenol A

RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)

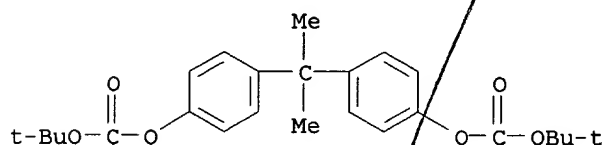
(resist contg. glyoxime deriv. as photo-acid generator)

RN 117458-06-7 CAPLUS

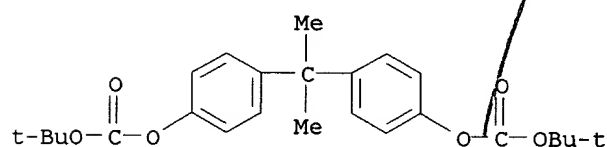
CN Carbonic acid, (1-methylethylidene)di-4,1-phenylene bis(1,1-dimethylethyl) ester (9CI) (CA INDEX NAME)



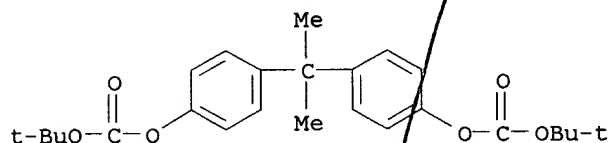
L25 ANSWER 12 OF 17 CAPLUS COPYRIGHT 2002 ACS  
 AN 1995:1002085 CAPLUS  
 DN 124:71378  
 TI Water-soluble onium salts: New class of acid generators for chemical amplification **positive resists**  
 AU Sakamizu, Toshio; Shiraishi, Hiroshi; Ueno, Takumi  
 CS Central Res. Lab., Hitachi Ltd., Tokyo, 185, Japan  
 SO ACS Symposium Series (1995), 614 (Microelectronics Technology), 124-36  
 CODEN: ACSMC8; ISSN: 0097-6156  
 PB American Chemical Society  
 DT Journal  
 LA English  
 AB Alkyl-substituted-sulfonium salts were synthesized and investigated with a view to applying them as the acid generator in chem. amplification **pos. resists**. It was found that the soly. in water of alkyl-substituted onium salts is high, while that of triaryl-substituted onium salt is quite low. This dissoln. promotion ability of alkyl-substituted onium salts increase with the decreasing mol. size of the alkyl group. The quantum yield for acid generation from dialkylarylsulfonium salt was one order of magnitude larger than those of trialkyl-substituted onium salts. A difference was obsd. in acid-generation efficiency between electron-beam exposure and deep-UV exposure. We will discuss with this difference in terms of acid generation mechanism. Water-sol. onium salts were detd. to be effective acid generators for electron-beam exposure: they can produce high resolu. patterns (100-nm contact holes).  
 IT **117458-06-7**, 2,2-Bis[p-(tert-butoxycarbonyloxy)phenyl]propane  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (dissoln. inhibitor; water-sol. onium salts as acid generators for chem. amplification **pos. resists**)  
 RN 117458-06-7 CAPLUS  
 CN Carbonic acid, (1-methylethylidene)di-4,1-phenylene bis(1,1-dimethylethyl) ester (9CI) (CA INDEX NAME)



L25 ANSWER 13 OF 17 CAPLUS COPYRIGHT 2002 ACS  
 AN 1995:67725 CAPLUS  
 DN 122:92625  
 TI Structural design of acid-decomposable dissolution inhibitors for a 3-components **positive CA resist**  
 AU Aoi, Toshiaki; Yamanaka, Tsukasa; Kokubo, Tadayoshi  
 CS Reseach Lab., Fuji Photo Film Co. Ltd., Shizuoka, 421-03, Japan  
 SO Proceedings of SPIE-The International Society for Optical Engineering (1994), 2195 (Advances in Resist Technology and Processing XI), 111-25  
 CODEN: PSISDG; ISSN: 0277-786X  
 DT Journal  
 LA English  
 AB A design of 3-components pos. chem. amplification (CA) resist system (consists of acid-decomposable low mol. dissoln. inhibitor / **photo-acid generator (PAG)** / phenolic resin binder) was investigated. A series of model inhibitors were newly synthesized and examd. for the structural influence to their inhibition efficiency on novolak (NVK) dissoln. The hydrophobicity and the mol. size of the inhibitor as well as the dispersivity of the acid decomposable groups in the mol. were found influential. By maximizing those parameters, the inhibitor with improved inhibition by three orders of magnitude compared to the previously known ones was obtainable. This even enabled the use of poly(p-hydroxystyrene) (PHS) as a binder, generally known to suffer from poor inhibition, in place of NVK. A mol. conformational anal. as well as IR spectrum anal. were carried out on the key materials for discussion of the inhibition mechanism. A mol. interaction model between the inhibitor and the hydrophilic site of binder, a similar model to DNQ-PAC / NVK system, was proposed for the mechanism. The 3-components resist samples formulated with simple phenolic binders and the improved inhibitor performed well on imaging under KrF excimer laser exposure. A 0.24 .mu.m L/S image with vertical profile was obtainable.  
 IT **117458-06-7P**  
 RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (design and synthesis of acid-decomposable dissoln. inhibitors for 3-component **pos. chem.-amplified resist**)  
 RN 117458-06-7 CAPLUS  
 CN Carbonic acid, (1-methylethylidene)di-4,1-phenylene bis(1,1-dimethylethyl) ester (9CI) (CA INDEX NAME)



L25 ANSWER 14 OF 17 CAPLUS COPYRIGHT 2002 ACS  
 AN 1994:446390 CAPLUS  
 DN 121:46390  
 TI Acid generation and deprotecting reaction by diphenyliodonium  
 9,10-dimethoxyanthracene-2-sulfonate in a novolak **positive**  
**photoresist** based on chemical amplification  
 AU Naitoh, Kazuhiko; Yamaoka, Tsuguo; Umehara, Akira  
 CS Fac. Eng., Chiba Univ., Chiba, 263, Japan  
 SO Polymers for Advanced Technologies (1992), 3(3), 117-23  
 CODEN: PADTE5; ISSN: 1042-7147  
 DT Journal  
 LA English  
 AB In a **pos. photoresist** composed of diphenyliodonium  
 9,10-dimethoxyanthracene-2-sulfonate as a novel **photoacid**  
**generator**, bisphenol A protected with tert-butoxycarbonyl group as  
 a dissoln. inhibitor, and a novolak resist matrix, the efficiency of  
 photoacid generation and deprotective reaction were investigated by means  
 of UV-visible and IR spectroscopies. The quant. measurement of  
 photogenerated acid by using the acid-sensitive dye exhibited 0.18 as the  
 quantum yield of acid generation in novolak resin film. The lithog.  
 evaluation of this system as a chem. amplified resist was studied. The  
 catalytic chain length for the acid-catalyzed deprotection step was detd.  
 as about 100 when 10 min post-exposure bake (PEB) at 80.degree. was given.  
 The sensitivity and the resoln. as a **pos. resist** are  
 180 mJ/cm<sup>2</sup> and higher than 1 .mu.m, resp. under the PEB conditions  
 mentioned above.  
 IT 117458-06-7  
 RL: USES (Uses)  
 (photoreaction of, in **pos. novolak photoresist**  
 based on chem. amplification)  
 RN 117458-06-7 CAPLUS  
 CN Carbonic acid, (1-methylethylidene)di-4,1-phenylene bis(1,1-dimethylethyl)  
 ester (9CI) (CA INDEX NAME)



L25 ANSWER 15 OF 17 CAPLUS COPYRIGHT 2002 ACS

AN 1992:436357 CAPLUS

DN 117:36357

TI Determination of acid diffusion in chemical amplification **positive**  
deep-UV **resists**

AU Schlegel, Leo; Ueno, Takumi; Hayashi, Nobuaki; Iwayanagi, Takao

CS Cent. Res. Lab., Hitachi Ltd., Kokubunji, 185, Japan

SO Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes  
& Review Papers (1991), 30(11B), 3132-7

CODEN: JAPNDE; ISSN: 0021-4922

DT Journal

LA English

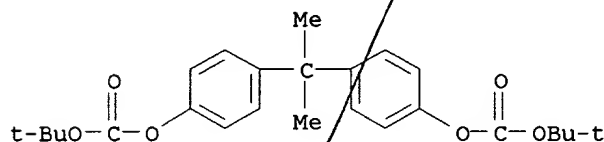
AB The diffusion of photogenerated acid in chem. amplification resist systems was examd. by a new method which was developed for an easy estn. of the diffusion range. The acid mobility was investigated for various process conditions. Prebake and post-exposure bake conditions had strong influence on the mobility of acid. The diffusion range of acid was much larger than values estd. from the catalytic vol. Large differences in diffusion characteristics were found for 2 different resist systems. The diffusion of various sulfonic acids decreased strongly with increasing mol. size.

IT 117458-06-7

RL: USES (Uses)

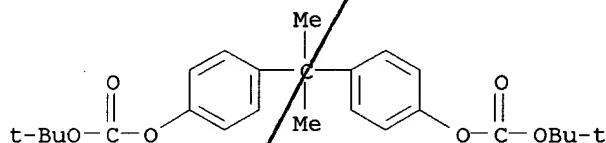
(chem. amplification **pos.** deep-UV **resists**formulation contg. novolak resin and **photoacid****generator** and dissoln. inhibitor of, detn. of acid diffusion  
in)

RN 117458-06-7 CAPLUS

CN Carbonic acid, (1-methylethylidene)di-4,1-phenylene bis(1,1-dimethylethyl)  
ester (9CI) (CA INDEX NAME)



L25 ANSWER 16 OF 17 CAPLUS COPYRIGHT 2002 ACS  
 AN 1991:32957 CAPLUS  
 DN 114:32957  
 TI Studies on the acid formation and deprotection reaction by novel  
 sulfonates in a chemical amplification **positive**  
**photoresist**  
 AU Schlegel, Leo; Ueno, Takumi; Shiraishi, Hiroshi; Hayashi, Nobuaki;  
 Iwayanagi, Takao  
 CS Cent. Res. Lab., Hitachi Ltd., Kokubunji, 185, Japan  
 SO Journal of Photopolymer Science and Technology (1990), 3(3), 281-7  
 CODEN: JSTEEW; ISSN: 0914-9244  
 DT Journal  
 LA English  
 AB Tri(methanesulfonyloxy)benzene was investigated as a **photoacid**  
**generator** for a **pos.** deep-UV **resist** consisting  
 of bisphenol A protected with tert-2-butoxycarbonyl groups and a novolak  
 matrix polymer. UV- and IR-spectroscopic analyses of the deprotection  
 reaction gave an extraordinarily high quantum yield of acid generation,  
 suggesting sensitization by the novolak polymer. The facts that a similar  
 system replacing the novolak with cellulose acetate was not photosensitive  
 at all, and that the spectral sensitivity of the novolak-based resist  
 coincided with the absorption spectrum of the novolak resin supported this  
 suggestion.  
 IT 117458-06-7  
 RL: USES (Uses)  
 (photoresist compn. contg. novolak and  
 tris(methanesulfonateoxy)benzene **photoacid generator**  
 and)  
 RN 117458-06-7 CAPLUS  
 CN Carbonic acid, (1-methylethylidene)di-4,1-phenylene bis(1,1-dimethylethyl)  
 ester (9CI) (CA INDEX NAME)



L25 ANSWER 17 OF 17 CAPLUS COPYRIGHT 2002 ACS  
 AN 1990:226587 CAPLUS  
 DN 112:226587  
 TI Acid formation and deprotection reaction by novel sulfonates in a chemical amplification **positive photoresist**  
 AU Schlegel, L.; Ueno, T.; Shiraishi, H.; Hayashi, N.; Iwayanagi, T.  
 CS Cent. Res. Lab., Hitachi Ltd., Kokubunji, 185, Japan  
 SO Chemistry of Materials (1990), 2(3), 299-305  
 CODEN: CMATEX; ISSN: 0897-4756  
 DT Journal  
 LA English  
 AB A **pos. deep-UV photoresist** was composed of tris(methanesulfonyloxy)benzene as a novel **photoacid generator**, bisphenol A protected with tert-butoxycarbonyl groups as a dissoln. inhibitor, and a novolak matrix polymer. The deprotection reaction by the generated methanesulfonic acid was studied by using UV spectroscopy. The results were compared with exposure characteristics obtained with the same resist in lithog. The deprotection degree, the catalytic chain length of the deprotection reaction, and the quantum yield of the acid generation were detd. The amt. of photogenerated acid was unexpectedly high. This could be due to a sensitizing effect of the strongly absorbing novolak matrix polymer to generate the acid with high efficiency. The results show that sulfonic acid esters have very high possibilities for application in deep-UV resist materials.  
 IT 117458-06-7  
 RL: USES (Uses)  
 (photoresist compn. contg. methanesulfonyloxybenzene **photoacid generator** and, deprotection reaction of)  
 RN 117458-06-7 CAPLUS  
 CN Carbonic acid, (1-methylethylidene)di-4,1-phenylene bis(1,1-dimethylethyl) ester (9CI) (CA INDEX NAME)

